ATOMIC ENERGY newsletter®

A SERVICE FOR INDUSTRY BUSINESS ENGINEERING AND RESEARCH
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Dear Sir:

Western New York Nuclear Research Center, at University of Buffalo, was formally dedicated last Thursday (April 19) following two technical symposia the preceding day at the Center. The research reactor of the Center had become critical March 24; of the pool type, it was designed and built by American Machine & Foundry's atomic division. Financing for the $2.2 million Center was by a grant from New York State; contributions by seven Western New York industrial firms; National Science Foundation; National Institute of Health; and USAEC. It is expected that by June 1, 1961 the Center will be fully operative and ready for research work.

Some 15% of outstanding shares of Nuclear Science & Engineering Corp., have been purchased by Atlantic Research. The sale involved 30,000 shares of the Pittsburgh, Pa., firm which specializes in isotope applications and reactor research and development. It is intended that the two firms will cooperate on technical programs which are "beyond the scope of either company alone". (Other FINANCIAL NEWS, p.4 this LETTER.)

Indonesia will receive grant from the U.S. of $350,000 toward the cost of a nuclear research reactor for the Institute of Technology, Bandung. Reactor will be 100 kw Triga-type reactor to be supplied by General Atomic division of General Dynamics Corp.; fuel elements of the Mark II Triga combine a zirconium-hydride moderator with 20% enriched uranium and are constructed specially for the reactor. In addition to the reactor, the project includes laboratories for nuclear physics, nuclear chemistry, radio-biology, health physics, and radioisotope preparation, with supporting facilities. Holmes and Narver are assisting in the design of the reactor building and laboratories, and supervising construction which will be done by local firms. (Other REACTOR NEWS, p.5 this LETTER.)

Three hundred air cleaning precipitators will be built for U.S. nuclear submarines by Research-Cottrell, Inc., under U.S. Navy contract of "over $1 million". Units are designed to clean about 1 million cu. ft. of air per minute. Each will have two stages--a charging section of 17 kv. and a collecting section that varies from 7 to 17 kv. (Other PRODUCT NEWS, p.2 this LETTER.)

Discovery of an isotope of element 103 has been made by nuclear chemists Albert Ghiorso, Torbjorn Sikkeland, Almon E. Larsh, and Robert M. Latimer, working at the University of California's Lawrence Radiation Laboratory with the heavy ion linear accelerator there. A paper on the research, which was supported by the USAEC, has been sent to Physical Review Letters for publication. The element 103 isotope was the first to be discovered solely by nuclear methods. No chemical techniques were used in its identification. (Other RESEARCH STUDIES, p.2 this LETTER.)

Grant of $110,000 has been made by Department of Defense to Rensselaer Polytechnic Institute for two years of study of methods of detecting world-wide nuclear detonations. The project will attempt to differentiate between earthquakes and explosions by recording and analyzing the water level fluctuation in deep wells.

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NEW PRODUCTS, PROCESSES, INSTRUMENTS...

NEW PRODUCTS: New Model 7 Juno survey meter is for measuring the intensity of and discriminating between alpha, beta and gamma radiation. An improved version of the original Hanford instrument, the Model 7 features a hermetically sealed switch box and dessicant cartridge, design improvements for better performance under adverse humidity conditions. The instrument has a high impedance circuit, a large open-face meter, and a new improved battery pack with over 800 hours of operating life. -- Technical Associates, Burbank, Calif.

Model ND-217 "Nomad I" is a new, low-cost, nuclear organic-moderated activation demonstrator which allows students to perform neutron radiation experiments in complete safety. The instrument uses low-level neutron sources to study basic neutron behavior and to produce tracer quantities of short-lived radioisotopes. It consists essentially of a mobile aluminum drum filled with a high-purity paraffin that acts as a neutron moderator and as shielding. Vertical ports are used as experimental facilities and are located at discrete diffusion lengths from a central "source" port.....Model RSC-241 is a new completely automatic windowless 4-pi chromatogram scanner that simultaneously traces a scan and integrates the area under each peak giving total counts. The instrument features a wide-grid pontentiometer recorder that has an automatic 10-speed transmission and an automatic integrator. -- Atomic Accessories, Inc., Valley Stream, N.Y.

PRODUCT NEWS: Some 9,480 kg of natural uranium fuel have been shipped by the USAEC since 1958 to four countries for use in subcritical nuclear facilities. Recipients were Italy (1,999 kg); Greece (2,494 kg); Brazil (2,494 kg); and Turkey (2,493 kg). The $379,200 cost of the fuel was paid for by U.S. grants.

Kit to convert closed-circuit industrial television equipment to three-dimensional system is being offered by Stereotronics Corp., Los Angeles 28, Calif. The three-dimensional picture can assist in the remote handling of radioactive manipulations.

Scintillation flow detector for continuously monitoring alpha or beta activity in liquids or gases is now being offered by Packard Instrument Co., La Grange, Ill. The counter is said to be able to measure labeled compounds in aqueous solutions with more than 30% counting efficiency, and with background of about 20 to 25 counts per minute. Suggested uses are in radioactive monitoring of chemical reactions, biochemical fractionations, etc.

High purity thorium, zirconium and niobium are now being offered commercially in crystal bar form by Metal Hydrides, Inc., Beverly, Mass. Made by a technique based on the iodide process, interstitial C, O, N, and H are almost completely eliminated according to the company.

Exemption of certain rare earth materials containing thorium and uranium from USAEC licensing is restored in an amendment to regulations 10 CFR 40, "Licensing of Source Material". The exemption had been dropped in a recent revision of these regulations. Re-establishment was on petition of American Potash & Chemical Corp. which said specific licensing was unjustified from standpoint of public health and safety. The Commission after examining radioactivity exposure data furnished by the company covering rare earth material manufacturing since 1956 of Lindsay Chemical Co. division of American Potash agreed that uranium and thorium in such materials represented no hazard to public safety or security.

Trilaterial contract between the U.S., Norway and the UN's International Atomic Energy Agency was signed last week in Vienna permitting the transfer of nuclear materials through the Agency to one of its member states. Under the leasing terms of the contract the USAEC will provide a fuel core enriched to 3% in uranium-235 for use in a zero-power critical assembly at the Norwegian Institute for Atomic Energy, near Oslo. Norway is making this critical assembly available for an Agency-sponsored cooperative program design to obtain basic nuclear data for power reactor work. (Two other core loadings are being provided by Norway. One consists of natural uranium; the other, originally bought by Norway from the U.S., is enriched to 1.7% in uranium-235.

A means to increase the survival rate of mice after they were exposed to ionizing radiation was described by E. John Ainsworth of Argonne National Laboratory in a paper delivered last week at the 45th annual meeting of the Federation of American Societies for Experimental Biology. Dr. Ainsworth noted that while many radiation protective substances are known, the majority must be given within a few minutes or few hours before irradiation, and are without protective effect if given following irradiation. His work concerned intravenous injection of Pseudomonas pyrogens at 2, 8, or 24-hours after a radiation dose; such injections increased the survival rate.

ATOMIC ENERGY CONTRACT NEWS...

CONTRACTS AWARDED: Contract in the value of $786,897 has been awarded by Union Carbide Corp. to Westinghouse Electric's atomic fuel division for fabrication of 1739 fuel elements for the USAEC's experimental gas-cooled reactor being built at Oak Ridge. Union Carbide operates Oak Ridge National Laboratory which in turn is handling design, development and procurement of fuel elements and control rods for that reactor. Except for the fuel elements and control rods, the reactor is being designed by Kaiser Engineers, Oakland, Calif., and Allis-Chalmers Mfg. Co., Washington, D.C. The reactor is being built by H. K. Ferguson Co., Cleveland, Ohio, under USAEC contract. It is scheduled for completion late next year, and will be used for experimental work designed to advance gas-cooled technology.....Testing of nuclear materials for Mitsubishi Atomic Power Industries, Inc., Tokyo, Japan, will be handled by Westinghouse Electric under contract negotiated by Westinghouse Electric International Co. Tests on uranium dioxide fuel made by a swaging process, developed by the Japanese firm will be carried out at the Westinghouse testing reactor, Waltz Mill, Pa.

Under recent $46,000 contract award made by the USAEC to Tracerlab, Inc., Waltham, Mass., methods of producing "scintillating resins" will be investigated by the company. The work will involve combining a scintillation phosphor with an ion exchange resin in an effort to produce a low-cost method of detecting trace amounts of isotopes. It is believed that the resin would concentrate the isotope enough to be detected by the phosphor. This would enable detection of trace amounts of strontium, or yttrium in drinking water.

Byron Jackson Pumps, Inc., Los Angeles, Calif., will supply three primary coolant pumps for Oak Ridge National Laboratory's high flux isotope reactor under recently awarded $151,000 contract received by the firm from Union Carbide Corp., operator of Oak Ridge National Laboratory. (The high flux reactor, expected to be in operation by 1964, will be used primarily for production of transuranium elements for research purposes. Designed for operation at 100 mw, the water cooled reactor will use fully-enriched uranium fuel in a flux-trap configuration.)

Contract for nuclear rocket engine research has been received by Aerojet-General's nuclear propulsion division, Azuza, Calif., from the Air Force. Acting as prime contractor for the Air Force Flight Test Center, Edwards Air Force Base, Aerojet is preparing preliminary design criteria for nuclear propulsion systems ranging from the upper stage thrust levels to multi-million pound thrust boosters. The study will also provide development requirements, facilities, scheduling and costs associated with the various engine designs.

Under recent contract agreement made between Western Gold and Uranium, Inc., and Rare Metals Corp., all uranium ore produced from Western's Orphan mine at Grand Canyon, Ariz., to the end of 1966 will be sold to Rare Metals for processing in the latter's mill at Tuba City, Arizona. The contract is subject to award of a 1962-66 production allocation to Western Gold by the USAEC and the conclusion of a milling contract extension through 1966 between Rare Metals Corp. and the USAEC, on both of which negotiations are now in progress.

NEW BOOKS & OTHER PUBLICATIONS...

Control of Nuclear Reactors and Power Plants. Second edition. M. A. Schultz, Westinghouse Electric Corp. Contemporary account of the use of servomechanism techniques as a method for the control of a nuclear power plant. 462 pages. --McGraw-Hill Book Co., New York 36 ($12.50)

Power Reactor Technology. Jame K. Pickard, Frederick H. Warren, William W. Lowe, Stuart McLain, editors. Material selected and edited from the 1958 Geneva Conference. --D. Can Nostrand Co., Princeton, N.J. ($11.25)

Nuclear Pulse Spectrometry. Robert L. Chase, Brookhaven National Laboratory. Electronic techniques and physical principles that relate to the problem of cataloging electrical signals from nuclear radiation devices. 250 pages. --McGraw-Hill Book Co., New York 36 ($8.50)

The Transmission Matrix Method for Penetration Problems. Work done for Air Research & Development Command. Describes practical machine method for computing transmission and reflection of radiation by laminated slab shields. No. PB-171,341. ($4.00).....Influence of AET Upon Uptake of Iron-59 by Blood Cells of Gamma-Irradiated Rats. No. PB-171, 160. (50¢) Office of Technical Services, Wash. 25, D.C.

ATOMIC ENERGY PATENT DIGEST...

PATENTS ISSUED April 11, 1961 to PRIVATE ORGANIZATIONS AND/OR INDIVIDUALS: Processing of uranium ores. Robert A. Koble, inventor. No. 2,979,378 assigned to Phillips Petroleum Co. (2) Scintillation detector circuit. Alexander Somerville, inventor. No. 2,979,617 assigned to General Motors Corp., Detroit, Mich. (3) Helium-3 logging method. James A. Rickard, inventor. No. 2,979,618 assigned to Jersey Production Research Co., Tulsa, Okla. (4) Nuclear reactor control device. Mark R. Dusbabek, inventor. No. 2,979,450 assigned to the Fluor Corp., Los Angeles, Calif.

PATENTS ISSUED April 11, 1961 to GOVERNMENTAL ORGANIZATIONS: (1) Air radioactivity monitor. R. Louis Bradshaw, Jess W. Thomas, inventors. No. 2,979,620 assigned to Secretary of the Army. (2) Extraction of uranium. Earl G. Schmieding, Archie E. Ruehle, inventors. No. 2,979,379 assigned to USAEC. (3) Preparation of compacts made from uranium and beryllium by sintering. Roswell P. Angier, inventor. No. 2,979,399 assigned to USAEC. (4) Clashing beam particle accelerator. Richard J. Burleigh, inventor. No. 2,979,635 assigned to USAEC.

PATENTS ISSUED April 18, 1961 to PRIVATE ORGANIZATIONS AND/OR INDIVIDUALS: (1) Recovery of lithium from lithium bearing ores. Robert D. Goodenough, Vernon A. Stenger, inventors. No. 2,980,499 assigned to Dow Chemical Co., Midland, Mich. (2) Process for preparing zirconium oxide. Gerd Rossmy, inventor. No. 2,980,507 assigned to Th. Goldschmidt A. G., Essen, Germany. (3) Radiation meter incorporating a radioactive element. Herve Louis E. Bongrain, Michel A. Agon, inventors. No. 2, 980,799 issued to inventors of record.

PATENTS ISSUED April 19, 1961 to GOVERNMENT ORGANIZATIONS: (1) Radio ranging device. Joseph W. Gratian, Anne C. Gratian, Robert T. Nieset, Marlan E. Bourns, Horace R. Crane, inventors. No. 2,980,905 assigned to USAEC.

ATOMIC ENERGY FINANCIAL NEWS...

DEBENTURE OFFERING PROPOSED: Registration statement has been filed with the SEC by Aerojet General Corp., Azuza, Calif., for registration of $15 million of sinking fund debentures due 1961 to be offered for public sale. The company and a subsidiary are developing a portable gas cooled nuclear power system for the USAEC and small nuclear power plants for use in space vehicles for the Air Force and National Aeronautics & Space Administration. The company also develops and manufactures rocket engines, etc. Net proceeds of the debenture sale will be used in part ($6 million) to repay short-term indebtedness owed to General Tire & Rubber Co., parent with the balance for repaying short-term bank loans.

SALES UP FOR NUCLEAR PRODUCTS MANUFACTURER: Orders of Ohmart Corp., Cincinnati, Ohio, manufacturer of nuclear gauging systems were up 57% in the first quarter of the company's 1961 fiscal year compared with the first quarter of fiscal 1960. Based on an unaudited statement, first quarter 1961 profits are approximately 39¢ per share of common stock, the company reports. Earnings before taxes are 35% ahead of the 1960 first quarter. (The company is planning to increase authorized shares from 50,000 with $1 par value to 300,000 without par value. A three for one stock split on outstanding shares is also planned.)

MINERAL FIRMS SHOW BETTER EARNINGS: Standard Beryllium Corp., has reported to shareholders net profits for 1960 of $69,021 which is three times better than the previous year. Sales of $646,042 in 1960 were up from $336,218 in 1959.

Union Miniere du Haut-Katanga has declared dividend for 1960 of $30 per share; advance payment of $12 per share was made to stockholders in January. The company is a producer of uranium, cobalt, copper, germanium, silver and cadmium from its mines in the Congo. Of recent years, greater percentage of the company's income has been from non-uranium production, i.e., copper, etc.

Net profit for the year for Gunnar Mines, Canadian uranium producer was $5,184,263 equivalent to $1.46 per issued share, the company has reported to stockholders. Working capital increased to $25,611,495 and stockholders equity rose to $7.23 per issued share. Operations in 1960 showed all-time record for pounds of uranium oxide produced, a new high in metallurgical efficiency, and the lowest milling costs yet achieved, according to Gilbert A. La Bine, president. Mr. La Bine noted that Gunnar was working with the British Metal Corp. (Canada) in an effort to increase sales of product to free world consumers; such sales in 1960 were negligible, with almost entire output going to Eldorado Mining under contracts.

ATOMIC ENERGY BUSINESS NEWS...

DRESDEN NUCLEAR POWER STATION TO RESUME OPERATIONS: Advisory Committee on Reactor Safeguards of the USAEC has cleared the 180,000 kw Dresden nuclear power station of Commonwealth Edison Co. for resumption of operations. The plant had been shut down Nov. 15, 1960 due to failure of control rod mechanisms. The Advisory Committee noted that the plant can be operated at full power with new control rod design in view of the company's surveillance and inspection program and the fact that some experience exists in the use of the new type of control rods. The general type of rod has been used in the Vallecitos boiling water reactor during 19 months of operation and in the organic moderated reactor experiment since 1957. However, the Committee is not convinced that the rod design will be suitable for the planned life of the reactor. It is intended to resume Dresden operations next month.

NAVY RELUCTANT TO BUILD ADDITIONAL NUCLEAR PROPELLED SURFACE SHIPS: Recently published "position paper" of the Navy--Treatise on Nuclear Propulsion in Surface Ships--states that further plans for a nuclear surface fleet are now barred by budget considerations until nuclear construction costs more nearly approach those of conventional vessels. Nuclear costs are about 50% higher than conventional, the paper points out. No new nuclear vessels are included in the Navy's budget, and none have been ordered since 1957. At present, three nuclear powered surface vessels are under construction: the aircraft carrier Enterprise and the cruiser Long Beach, both due for completion this year and the frigate Bainbridge launched last week. (Nuclear propulsion plant for the Bainbridge is being designed and developed by Knolls Atomic Power Laboratory, Schenectady, N.Y. Work is being directed by the naval reactors branch of the USAEC. The system will use twin reactors cooled by pressurized water. A Bainbridge prototype reactor is being constructed at the Knolls site, at the present time.)

AMENDMENT PROPOSED IN INSURANCE REGULATIONS: Proposed amendment to the USAEC's regulations concern change in the public liability policies which are issued by the two nuclear energy liability insurance syndicates. The two insurance syndicates which issue the liability policies--NELA and MAELU--have asked for amendatory endorsement of their policies to eliminate certain ambiguities which might arise in the present policies because of language now used. Publication of the proposed change was in the Federal Register of April 14, 1961; interested comments are asked by the USAEC's Secretary, Wash. 25, D.C.

ORDER FOR URANIUM CARBIDE RECEIVED: Order for approximately 4,000-lbs. of 3.7% enriched uranium carbide has been received by Spencer Chemical Co. from Atomics International division of North American Aviation. To be supplied in a new crystalline form, the carbide will be used as prototype fuel elements in the sodium graphite reactor being designed by Atomics International for the Hallam (Nebraska) nuclear power station. The company believes that all future cores for the reactor will be uranium carbide if the prototype works out satisfactorily. It is estimated that the crystalline form can be produced at approximately one-half the cost of the ceramic form in which the carbide was originally supplied. (Depending on enrichment, quality, etc., selling price of the material ranges from $20 to $500 per pound.)

ACCELERATOR SALES MADE: Orders have been received by High Voltage Engineering Corp., Burlington, Mass., for its 5.5 million electron volt positive ion accelerator from Japan's Atomics Energy Research Institute; University of Padua, Italy; University of Frankfort, Germany; and University Laval, Canada. When completed, the four new particle accelerators will make a total of 15 such machines manufactured by the company for installations in the U.S. and abroad.

First delivery has been made of a Dynamitron particle accelerator of nine recent orders received by Radiation Dynamics, Inc., Westbury, N.Y. The unit, shipped to the Air Force Cambridge Research Laboratories, Bedford, Mass., furnished electron energies from 0.6 Mev up to 1.2 Mev with currents from 10 microamperes to 10 milliamperes. Probable uses for the machine by the Cambridge Laboratories include electronics material research including radiation damage effects on crystal lattice structure and on elemental electronic components.

Sincerely,

The Staff
ATOMIC ENERGY NEWSLETTER

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